

**COMMONWEALTH OF VIRGINIA**  
**Department of Environmental Quality**

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**Subject:** Water Quality Guidance Memo No. 06-200x and Waste Guidance Memo No. 01-2006, Landfill Disposal of Wastewater Treatment Byproducts

**To:** Regional Directors

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**Summary:**

Sewage sludge, grit, and screenings are generated at treatment facilities that treat domestic sewage, typically treatment works treating domestic sewage (TWTDSs). Sewage sludge is defined in the federal and State regulations, and must be treated and stabilized according to the regulations. Disposal of stabilized and dewatered sewage sludge at a landfill in accordance with the regulations is not typically an operational problem at the landfill. Grit and screenings are removed from wastewater by physical processes and are not explicitly defined as "sewage sludge" in any State regulations. TWTDSs that are hydraulically or organically overloaded, improperly operated, or obsolescent can generate grit and screenings with a high or untreated organic content.

This material has proven to be a nuisance, and in some cases a threat to public health and the environment during transportation and disposal at the landfill. This guidance provides information and standards that should reduce the nuisance or threat of this material to the waste management operators. Implementation of the guidance should help control odors at landfills, and should help reduce vector attraction from improperly treated grit and screenings.

**Electronic Copy:**

An electronic copy of this guidance is available for staff internally on DEQNet, and for the general public on DEQ's website at <http://www.deq.virginia.gov/waterguidancepermits.html> and <http://www.deq.virginia.gov/waste/guidance.html>

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**Disclaimer:**

**This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, it does not mandate any particular method nor does it prohibit any alternative method. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical adequacy and compliance with appropriate laws and regulations.**

## **1. Introduction:**

### **Background:**

Wastewater treatment facilities are typically designed and built to screen out, grind up, or separate debris that may be contained in the wastewater. Sticks, rags, large food particles, sand, gravel, toys, etc., must be removed from the wastewater to protect the pumping and other equipment in the treatment plant.

Treatment equipment such as bar screens, comminutors (a large version of a garbage disposal), and grit chambers are used as the wastewater first enters a treatment plant. Bar screens are also frequently utilized at the inlets of sewage pumping stations to protect the pumps therein. Screening devices, whether static or mechanical, typically remove large objects that may or may not contain putrescible material. Grit chambers typically remove sand, gravel, egg shells, and other non-putrescible material; modern grit chambers are agitated (typically with air) to minimize the putrescible material that may settle among the grit.

Grit and screenings should not be confused with sewage sludge (also known as biosolids). Biosolids are the residual solids remaining once the wastewater has undergone additional biological and chemical processes; unlike grit and screenings, biosolids are addressed extensively federal and state regulations that contain specific treatment and stabilization requirements. Ultimate disposal of stabilized and dewatered biosolids at a landfill in accordance with the regulations is not typically an operational problem at the landfill.

Disposal of wastewater treatment byproducts may be achieved through a variety of means, including, but not limited to, incineration, land application, composting and landfilling. Grit and screenings can be largely composed of inert material; consequently, incineration, land application and composting are problematic, if not impossible. As the management of sludge is extensively prescribed by law and regulations, this guidance will be confined to the landfilling of grit and screenings.

### **Purpose:**

The purpose of this guidance is to outline the legal and regulatory requirements pertaining to the disposal of the grit and screenings from wastewater treatment, and to provide water and waste permitting and compliance personnel with procedural recommendations regarding the disposal of these substances in sanitary landfills. The relevant legislative and regulatory requirements can be found at the end of this document.

## **2. Guidance Recommendation:**

Grit and screenings should be stable for purposes of acceptance and disposal at a landfill; stabilization should be performed in a manner that does not pose a direct contact hazard (pathogenic or chemical) to wastewater treatment plant staff, and the method of stabilization shall be detailed in the facility's O&M Manual. A simple stabilization method is the application of lime to control odors and reduce vector attraction. Since the landfill operations staff has the option of accepting or rejecting any waste material for disposal that is not stable or does not appear to be stable, this guidance is intended to help both the owner of the landfill and the TWTDS reduce the nuisance or threat of handling an unstabilized material.

**Implementation:**

1. Water Program will address in the VPDES permit manual the requirement that the facility include language pertaining to management of grit and screenings in their Operations and Maintenance Manual. Some items to consider:
  - a. If the organic content is less than 50%; and the material is mostly sand, gravel, rags, plastics etc., the O&M Manual shall require periodic lime application for odor reduction and vector attraction, and the material shall be dried to a point where it will pass the paint filter test (SW-846). Land application of this material is not permitted.
  - b. Lime shall be added to truck roll-off containers of grit and screenings, where roll-off containers must be covered manually for transportation by the truck driver and where there is a high potential for direct contact with the grit and screening material.
  - c. Lime application is optional only if ALL the following criteria are met:
    - (i) The organic content is <50%;
    - (ii) The TWTDS has wash down facilities for grit and screenings;
    - (iii) The TWTDS processes the dewatered grit and screenings directly into a closed container, and
    - (iv) The container stays closed during transportation, and there is no potential for direct contact during disposal, and
    - (v) there are no objectionable odors generated at the landfill or TWTDSs (i.e. no complaints).
  - d. If the organic content is greater than 50%, the material should be thoroughly dried and mixed with lime at the wastewater treatment works prior to landfilling. The pH of the resulting material shall not be higher than 12.5.
  - e. The organic content of the grit is determined by an initial characterization test for Volatile Solids (Standard Methods - 2540E for fixed and volatile solids). This test should be performed at least once by all TWTDSs that have grit removal facilities. Additional tests may be needed when there is significant change in the design or flow of the plant.
  - f. TWTDSs that generate solid waste from bar screens or other screening equipment do not need to test this material, because this material typically has a particle size of 2 inches or larger and is composed of wood debris, clothing, plastic, etc. Screenings should be dried and limed to reduce pathogens, odor and vector attraction. Screenings should not contain organic matter if the screen is coarse enough or if the screen has washing capabilities.
  - g. General liming of low organic grit depends on the organic content of the grit. General liming of grit (<50% organic) is recommended to start at 6% by dry weight.
2. Waste Program will:
  - a. Communicate the approved information from the TWTDS O&M Manual on the management of grit and screenings to the landfills during the inspections.
  - b. Communicate with the landfill about this guidance. The TWTDS has the primary responsibility to deliver a safe and stable waste material to the landfill for disposal. The Waste Program staff will communicate with the landfill operator to determine if landfill opportunities exist to stabilize the grit or screenings by

mixing the grit or screening material with other incoming waste prior to spreading the material on the landfill working face. Landfills occasionally receive coal ash, cement kiln dust, wood ash, boiler slag, crushed egg shells, crushed oyster shells, paper mill sludge or lime mud. These materials have a liming capability. The landfill may mix or blend untreated low organic grit or screenings from the TWTDS with these "lime" substitutes at the time of landfilling in lieu of liming at the TWTDS. If the opportunity to lime at the landfill exists, the landfill personnel will be advised to blend the grit or screenings on a one-to-one basis with the lime substitute material. Such operations must be documented by landfill staff.

### 3. Legislative and Regulatory Requirements:

#### Definitions of wastewater treatment byproducts:

Sludge is defined in several different state and federal regulations; the following citations are not comprehensive, but are sufficient to illustrate subtle differences that should be noted by DEQ staff:

- The *VPDES Regulation* (9 VAC 25-31-500), the *Federal Sewage Regulations* (40 CFR 503) and the *Federal Waste Open Dump Requirements* (40 CFR 257) define sewage sludge as "solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works."
- The *Solid Waste Regulation* (9 VAC 20-80-10) and the *Federal Waste Regulations* (40 CFR 258.2) define sludge as "any solid, semi-solid or liquid waste generated from a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of treated effluent from a wastewater treatment plant."

Note that while some regulations explicitly exclude grit and screenings from the definition of sludge, others do not. This has the potential of causing confusion depending on the regulation cited.

#### Stabilization of wastewater treatment byproducts:

- The *Solid Waste Regulation* (9 VAC 20-80-250.C.16.) establishes conditions under which sludge can be landfilled: "Sanitary landfills may receive the following types of solid wastes subject to specific limitations in the permit:
  - t. Sludges. Water treatment plant sludges containing no free liquid and stabilized, digested or heat treated wastewater treatment plant sludges containing no free liquid may be placed on the working face along with municipal solid wastes and covered with soil or municipal solid wastes. The quantities accepted should be determined by operational conditions encountered at the working face. For existing facilities without an adequate leachate collection system, only a limited quantity of sludge may be accepted. A maximum ratio of one ton of sludge per five tons of solid waste per day will be considered. Generation of leachate will be a basis for restriction of sludge disposal at such existing facilities."
- 9 VAC 20-80-250.C.17. establishes prohibitions on landfill disposal of sludge: "Sanitary landfills may not receive the following wastes:
  - e. Unstabilized sewage sludge as defined by the Department of Health or sludges that have not been

dewatered.”

Biosolids treatment processes are primarily designed to increase the solids content of the biosolids by separation and removal of liquid and are designed to stabilize the solid fraction through biochemical conversions that inactivate pathogens and reduce vector attraction characteristics and the potential for odor production.

Grit and screenings are not amenable to biochemical conversion, but are similar to biosolids in that the solids content, inactivation of pathogens, and vector attraction characteristics must be properly managed. Washing (where the facility has equipment for this), thorough drying and lime application should be sufficient to accomplish this.

Draft Guidance